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α-Pinene secondary organic aerosol at low temperature: chemical composition and implications for particle viscosity

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Table S1. Particle mass loadings (μg) on the filter and corresponding sampling times (min) at t0 and t1.

Exp. name	t0		t1	
	Mass loadings (μg)	Sampling time (min)	Mass loadings (μg)	Sampling time (min)
WDtoCH	4.07	20	3.93	20
WHtoCH	2.34	20	2.33	20
CH	6.60	13.5	6.19	5
CD	11.06	20	4.01	5

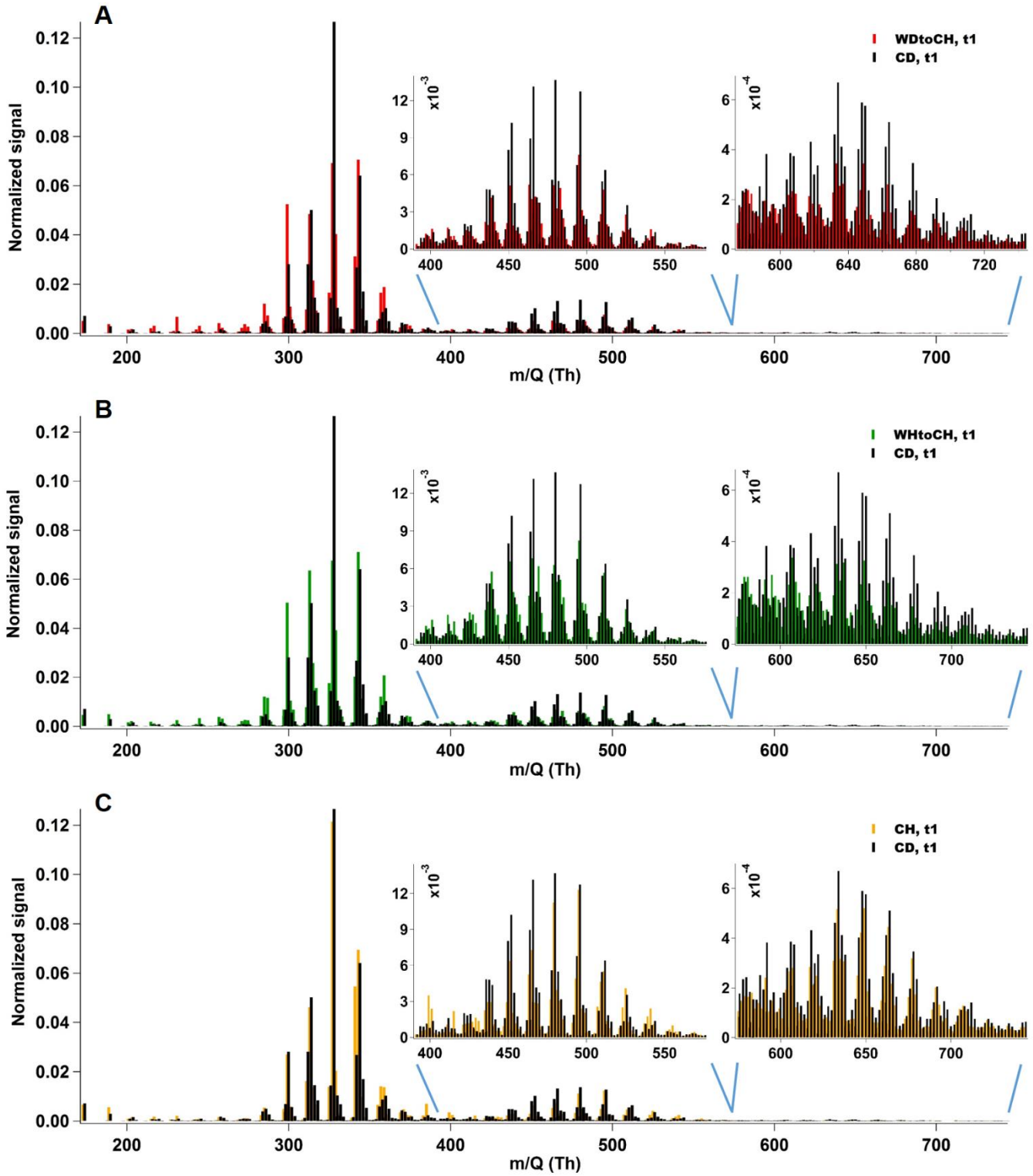

Figure S1. FIGAERO-CIMS mass spectra (normalized to the sum of signal of all detected CHOI compounds) of experiments WDtoCH and CD (A), WHtoCH and CD (B), CH and CD (C) at t1. Inserts show enlarged regions of dimers (left) and trimers (right).

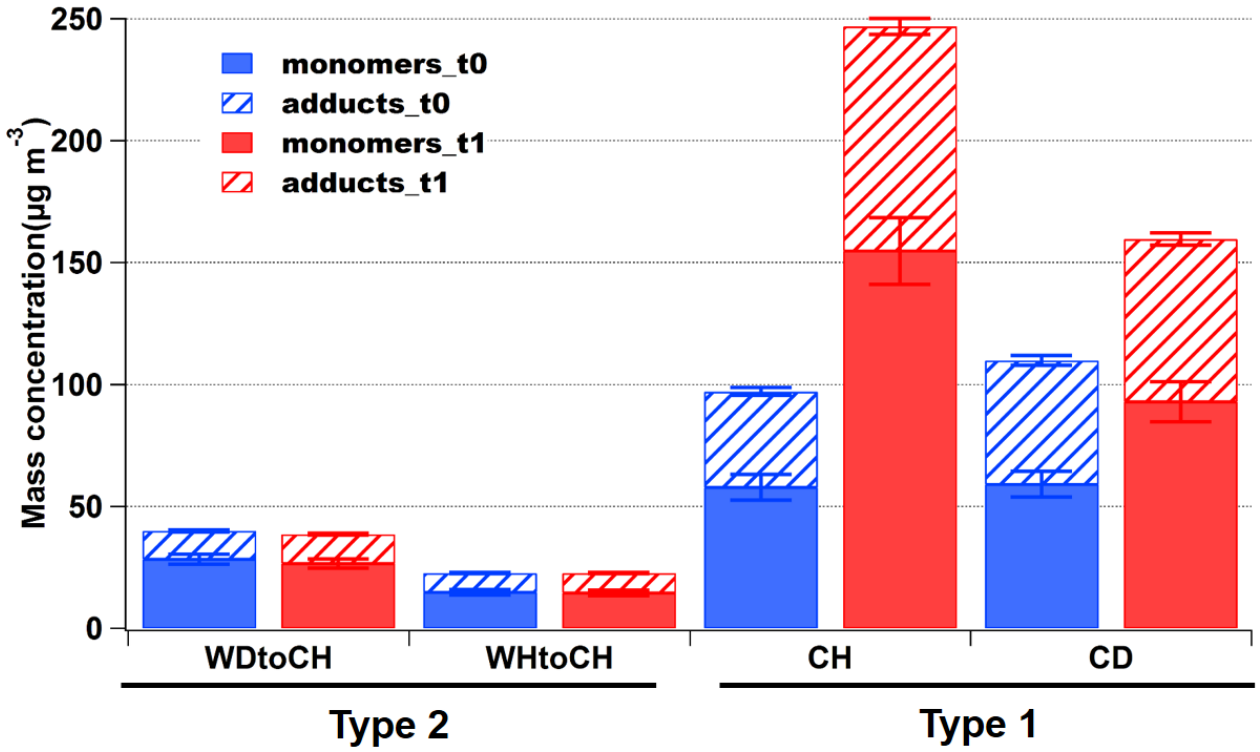

Figure S2. Absolute mass concentrations of monomers and adducts with error bars at t0 (blue) and t1 (red).

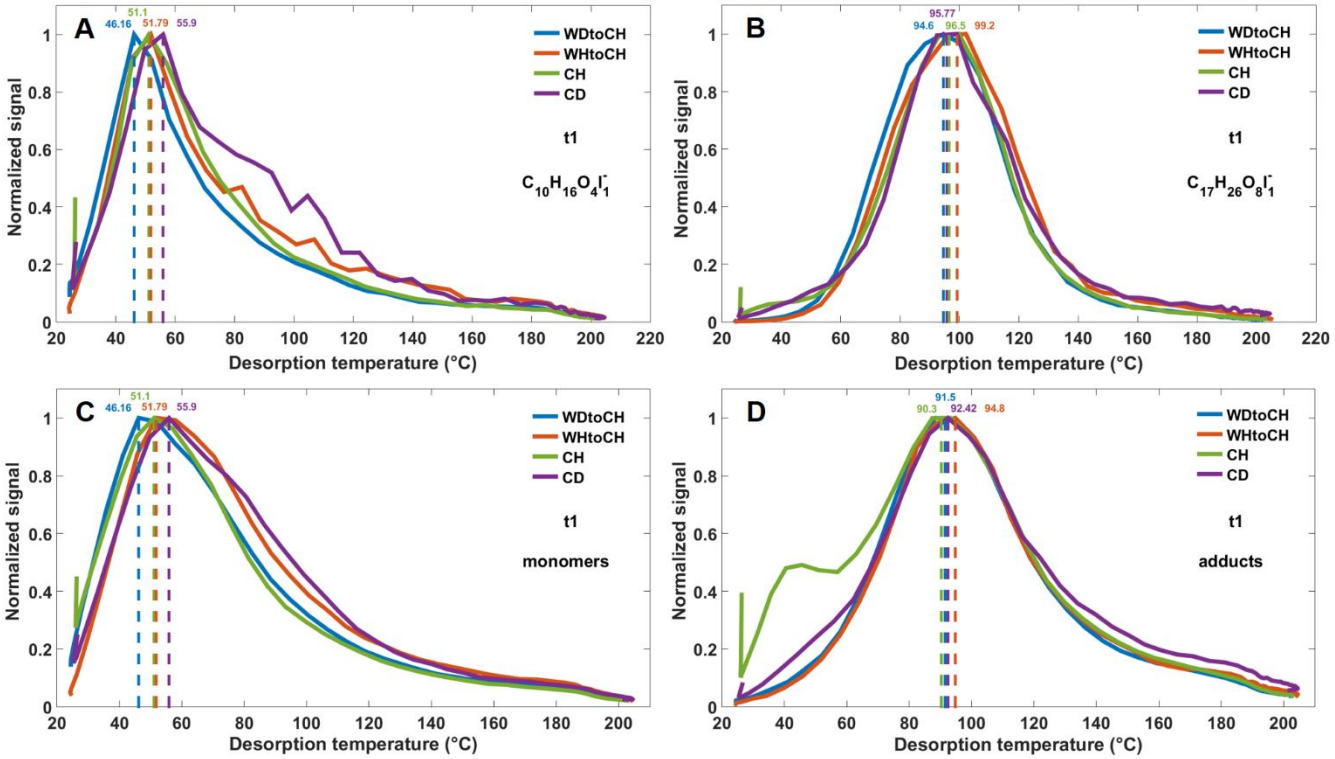

Figure S3. Thermograms of a monomer, $C_{10}H_{16}O_4$ (A) and an adduct, $C_{17}H_{26}O_8$ (B) both clustered with I^- at t1; sum thermograms of monomers (C) and adducts (D) at t1. Dashed lines refer to the corresponding T_{max}.

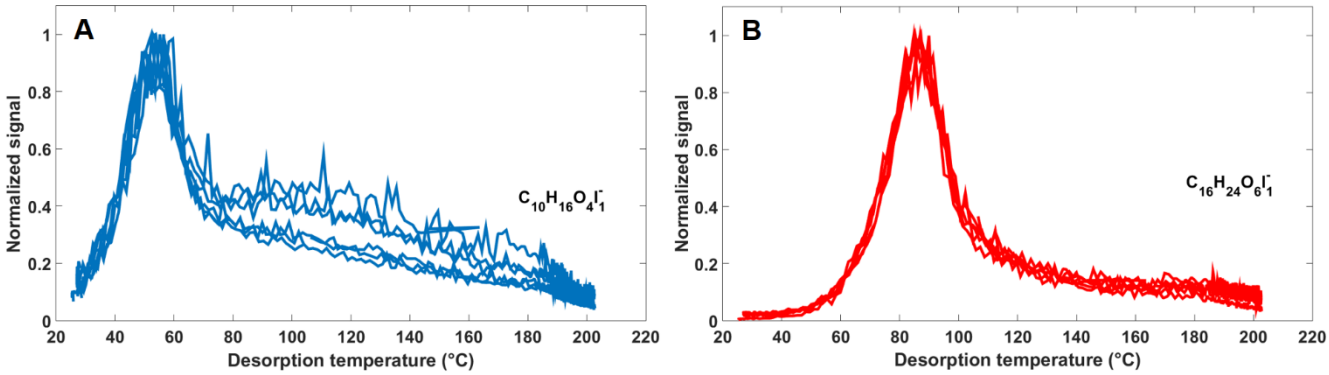

Figure S4. Thermograms of a monomer, $C_{10}H_{16}O_4$ (A) and an adduct, $C_{16}H_{24}O_6$ (B) both clustered with I^- under stable conditions.

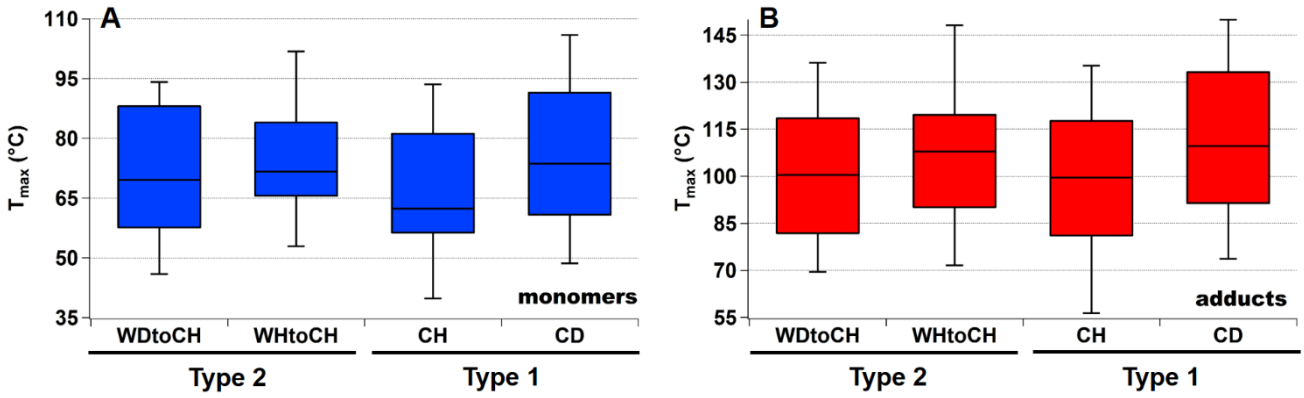

Figure S5. T_{max} box plot for monomers (A) and adducts (B) for four experiments at t0.

Mass loading effects

Different mass loadings on the filter due to different sampling times and/or sample concentrations influence thermogram shapes and thus T_{max}. Thermograms of the sums of all CHOI compounds, monomers and adducts for different filter mass loadings for WHtoCH and CD experiments were compared (Figure S6). The corresponding filter mass loadings are listed in Table S2. The box plot of T_{max} of all CHOI compounds, monomers and adducts increased with increasing mass loading on the filter (Figure S7). Beyond filter mass loadings of 2−4 µg the curves levelled off (saturation effect). Potential reasons for the observed effect of filter mass loading on T_{max} values are increased heat capacity of the increasing mass of the particle matrix, particle-particle interactions, and diffusion limitations due to several particle layers.

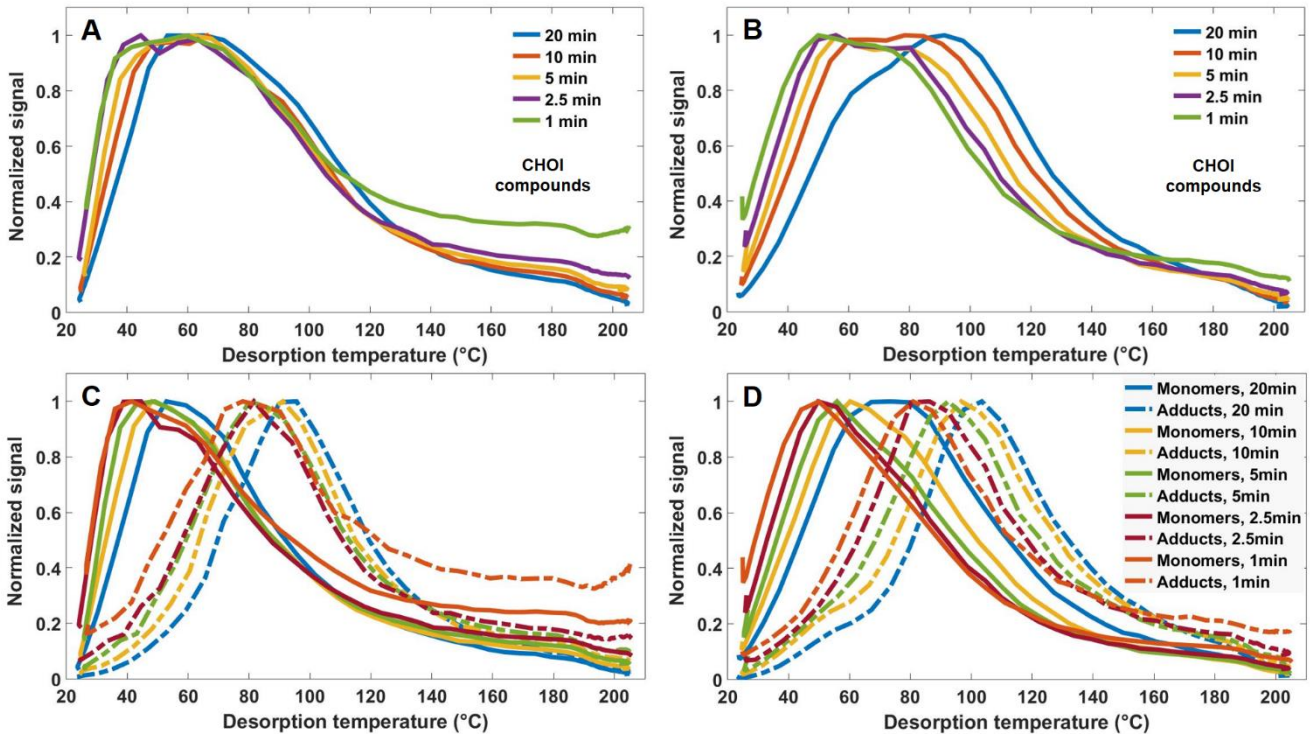

Figure S6. Sum thermograms of CHOI compounds with different sampling time for WHtoCH (A) and CD (B) experiments, and sum thermograms of monomers (solid lines) and adducts (dashed lines) for WHtoCH (C) and CD (D) experiments.

Table S2. Mass loadings (μg) on the filter with different sampling time for WHtoCH and CD experiments.

Exp. name	Mass loadings (μg)				
	20 min	10 min	5 min	2.5 min	1 min
WHtoCH	2.36	1.24	0.60	0.38	0.20
CD	11.06	7.25	4.01	2.08	0.94

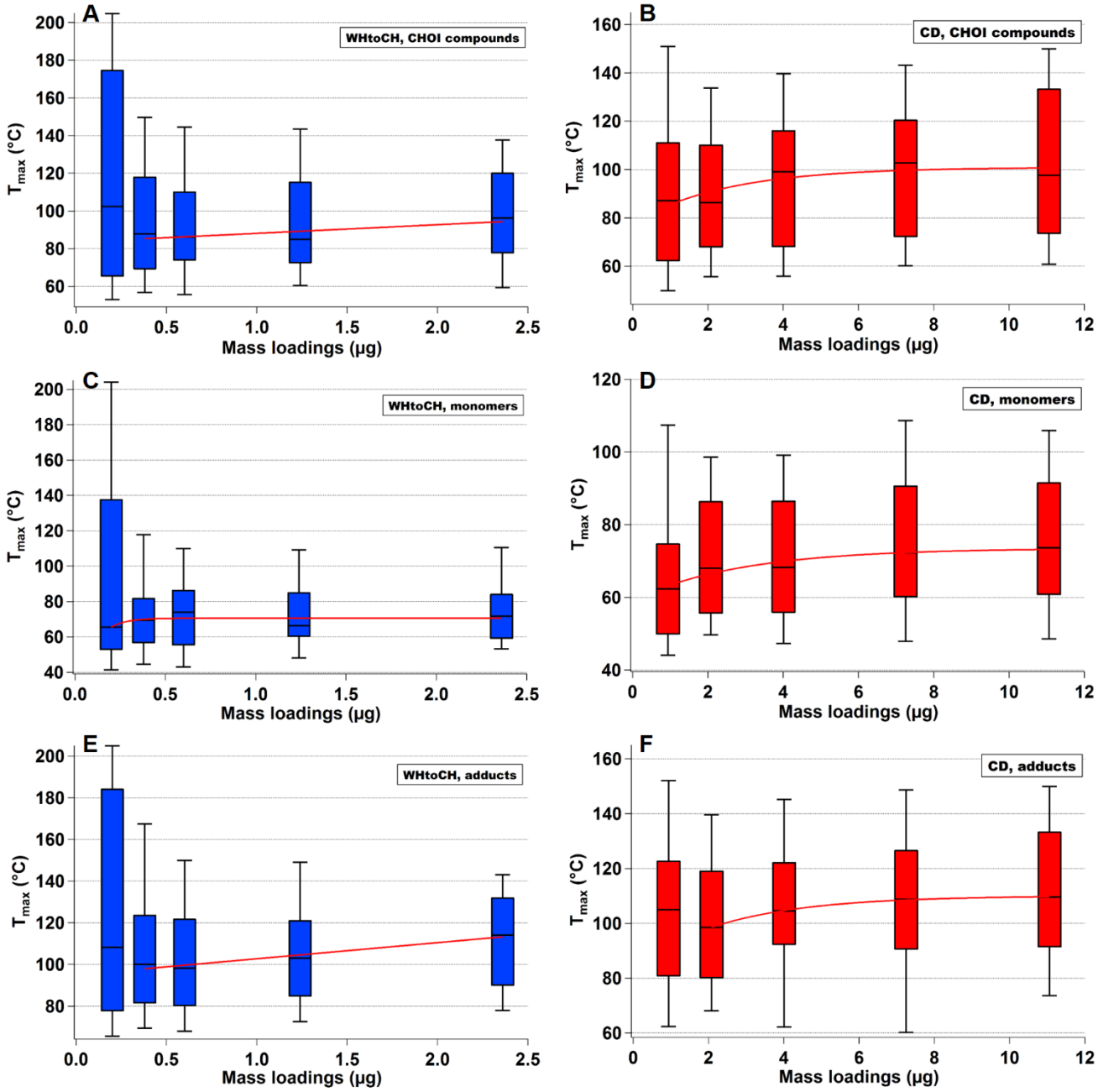

Figure S7. Box plot of T_{max} at different mass loadings for CHOI compounds (A−B), monomers (C−D) and adducts (E−F) for WHtoCH (left) and CD (right) experiments. Red lines refer to the exponential curves fitted for the median T_{max} in (A−D) and (F) except for linear fit in (E).